Hot Springs National Park, Bathhouse Row: Buckstaff Bathhouse: Mechanical & Piping Systems
One mile North of US Highway 70
on State Highway 7
Hot Springs National Park
Garland County
Arkansas

HAER NO. AR-4-G

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
P.O. Box 37127
Washington, D.C. 20013-7127

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HISTORIC AMERICAN ENGINEERING RECORD

HOT SPRINGS NATIONAL PARK, BATHHOUSE ROW: BUCKSTAFF BATHHOUSE: MECHANICAL AND PIPING SYSTEMS

HAER NO. AR-4-G

Location:	Hot Springs National Park, Garland County, Arkansas. One mile north of US Highway 70 on State Highway 7 (Central Avenue).
Date of Construction:	1912
Present Owner:	National Park Service
Present Use:	Presently used as a public bathing facility.
Significance:	The Buckstaff Bathhouse is part of Bathhouse Row, which represents a typical American Spa. The spring piping, heating and ventilation systems are examples of early twentieth century state-of-the-art technology.
Historian:	Diana Prideaux-Brune August 1987

[See HAER No. AR-4 for an overview history of Bathhouse Row.]

[See HABS No. AR-28 (A through I) for documentation of the architectural features of the bathhouses on Bathhouse Row.]

After a year of correspondence with the Department of Interior, and Hot Springs Reservation officials, the owners of the Buckstaff received approval for the construction of their heating and ventilation system in June of 1911. Previously, bathhouses had not been required to provide any mechanical ventilation, and the Interior Department and Reservation officials were anxious that the Buckstaff be the precedent for proper ventilation in all bathhouses on government property.[1] Plans and specifications of the Buckstaff mechanical design were sent to architects and engineers in Washington D.C. for approval.

Two tube-in-shell marine boilers supplied by the Hot Springs Plumbing and Machine Company provided a minimum of 100 pounds of steam pressure to the heating system. Each boiler was regulated by a McDonnell and Miller #47 Water Boiler control with blow-off valve, which replaced the original blow-off valve sometime in the 1930s.[2] The boilers are no longer in operation, as thermal water is used in the heating and tempering coils.

Air was circulated through the building by an 84-inch diameter blower provided by the National Blower Company. The construction of the blower, housing, and support were laid out carefully in the building specifications to insure quiet operation. Maximum air delivery was set at 27,800 cubic feet per minute, which changed the air in each zone eight times in one hour.

Tempering coils - four rows of 1" pipe - were specified to be placed above automatic by-pass dampers, and were set into a wall opening at the southern end of the wind tunnel. The tempering coils were of a horizontal tube type. The heating coils located between the fan and plenum were of cast iron set vertically.

All ducts were of galvanized steel, and manually operated balancing dampers were included for each zone. The mixing dampers were originally controlled by draft regulators on a Johnson pneumatic thermostat system. The pneumatic system has since been replaced by an electric one, although some original draft regulators remain in the plenum. The pneumatic tubing appears to have been made of galvanized steel, some of which remains.

Direct radiation was used in conjunction with the forced air system, and was used exclusively in some halls and storage facilities. The zone temperatures ranged from 105 degrees in some hot and pack rooms, to 70 degrees in hallways.

The multi-zone forced-air systems in combination with direct heat radiators seems to have been adequate as few changes to the system have been made. The Buckstaff is still in operation and, with the exception of added air conditioning and ventilation units, the original heating and ventilation system is still in place.

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[1] Harry M. Hallock to the Secretary of the Interior, May 2, 1911, HSNP Archives.

[2] Representatives of the McDonnell and Miller Company suggest that the #47 Boiler Water Control Units were first available in 1937.

MECHANICAL EQUIPMENT INVENTORY

BOILERS:

Two 64-inch by 16-ft, 4-inch long cylindrical steel "marine"-type fire-tube boilers. Fire-brick flue lining; asbestos lagging. Oil burning converted to gas. Dated 1911. Steam pressure regulated by McDonnell boiler water control added in the late 1930s. Boilers supply the steam coils in the hot-air system and the direct radiant-heat system.

Hot Springs Plumbing and Machine Company, AR Boilers
last inspection: 1966
McDonnell #47 boiler water control
McDonnell and Miller Inc., Chicago, IL
with large-area spring-closing blow-off valve
max. boiler pressure: 25 lbs
patents: 1934486, 1997785, RE 19558
first date available: 1936

CONDENSATE RETURN:

Using the "Van Auken system of Vacuum Heating," the condensate is pumped through a vacuum tank, air eliminator, and settling chamber before returning to the boilers.

Consolidated Engineering Co., Chicago, IL
Patent: 1908

BLOWER:

The blower chamber and plenum are constructed of sheet metal on a concrete foundation. Tempered and heated air is directed by sheet-metal dividers within the blower chamber and plenum. The blower forces heated air to the various zones of the building.

National Blower Works of Milwaukee
Westinghouse Electric, Type CW Induction Motor
10 HP
Style #: 1078775
Serial #: 1-13W214

LAUNDRY:
Washing Machines:
Huebsch Loadmaster
Pellerin Milnor
Dryers:
Pellerin Milnor
Water Heater:
Weben
Serial #: 40653
320 gallon, 125 psi

THERMAL WATER FLOW METER: Hays-Cochrane flow meter

[See HAER No. AR-4 for bibliography.]